

A Modern Approach to Predicting CO₂ emissions in Canadian ICE (Internal Combustible Engines)

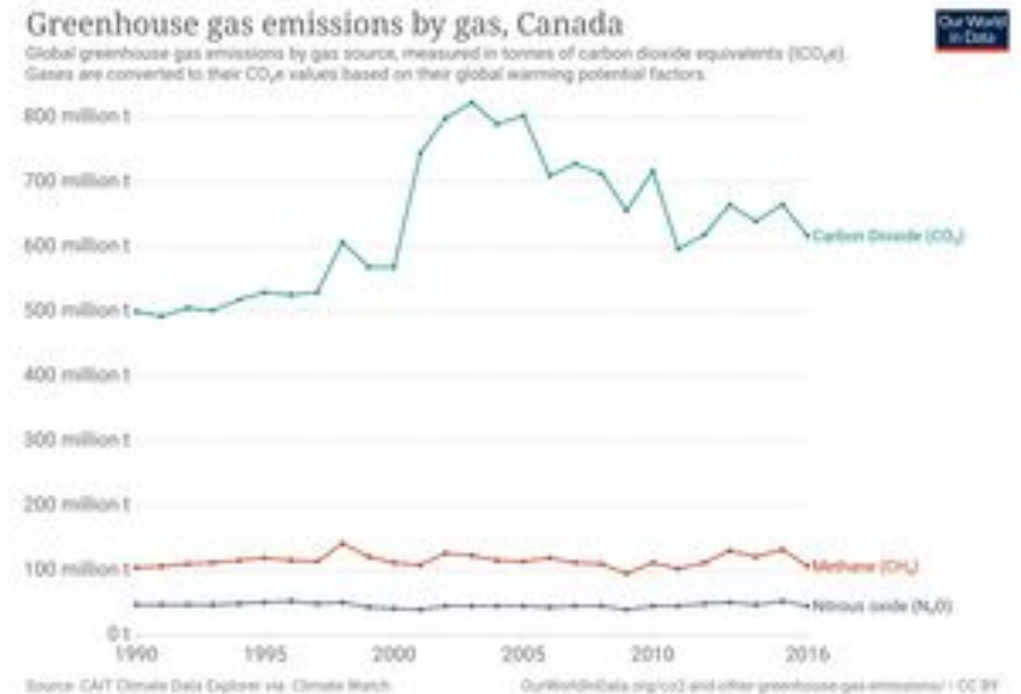
DATA 621: Fall 2020

Group 3

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Introduction & Motivation

- Climate Change is a top priority in 2019
 - Economic damage projected 1.5-25% GDP through end of century
 - Supported by majority of Canadians
- Canada dichotomous energy/climate change
 - 10% GDP still fossil fuel related
 - Major exports are oil, gasoline and cars



Introduction & Motivation

In 2019 Policy makers adopt Low Carbon Fuel Standard (LCFS) for Canada

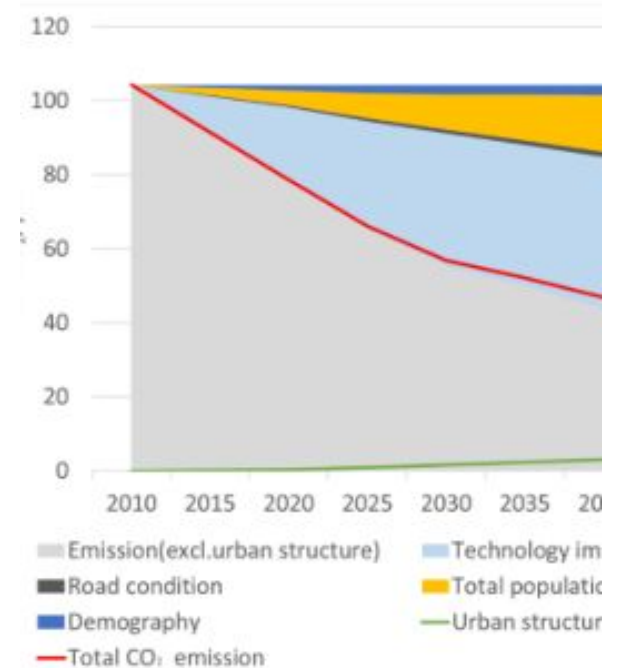
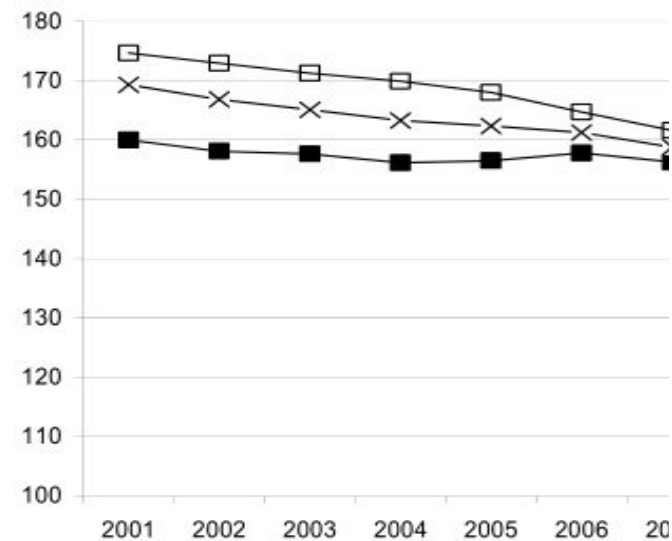
- Modeled after California
- Reduce CO₂ emissions in vehicles by fuel source



How can one quantify and predict CO₂ emissions in a diverse automotive fleet such as Canada?

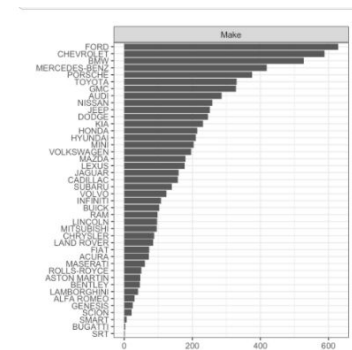
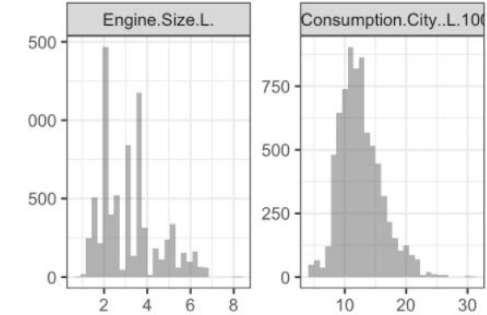
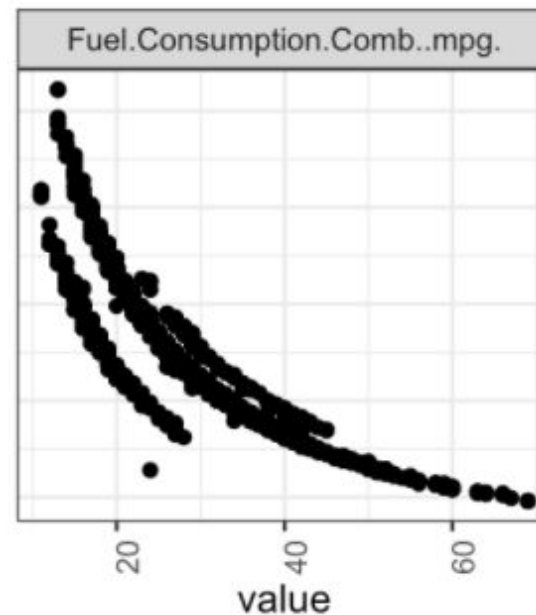
Literature Review

- Previous research focused on different representations of vehicle carbon emissions
- Theoretical Physical model of vehicle with rolling resistance, friction and other parameters (Fontaras & Panagiota, 2011)
- Linear model with factors such as mass, car type, engine or fuel (G. Mellios, 2011)
- Aggregate systems of traffic (multiple cars) as a stream (Kevin R. Gurney, 2012)
- Traffic dynamics involving changing population (Kii, 2020)



Exploratory Data Analysis

- Generated distribution on categorical and numerical features
- Engine Size [Displacement]
- Fuel Economy
- Make of Vehicle
- Class of Vehicle [SUV, Compact Mid-Size, etc]
- Type of Transmission
- Number of Cylinders



References

Full GitHub Repo: https://github.com/djlofland/DS621_F2020_Group3/tree/master/Final%20Project

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